

Claims

1. Measuring device for optically analysing especially a diagnostic test element (10) comprising a light source (16), a photodetector (24) and a device (12) for positioning the test element (10) in an optical path between the light source (16) and photodetector (24), the light source (16) having one or more organic light-emitting diodes (OLEDs) and the OLEDs (14) forming a composite structure by means of a support substrate (18) with an imaging optics (20) and/or the photodetector (24).
2. Measuring device as claimed in claim 1, **characterized in that** a plurality of OLEDs (14) are arranged on the support substrate (18) as a one-dimensional or two-dimensional light-emitting pixel array.
3. Measuring device as claimed in claim 1 or 2, **characterized in that** the OLEDs (14) have emission wavelengths ranges that are different from one another.
4. Measuring device as claimed in one of the claims 1 to 3, **characterized in that** the OLEDs (14) are preferably aligned in a grid-like manner on different illumination target areas.
5. Measuring device as claimed in one of the claims 1 to 4, **characterized in that** the OLEDs (14) are composed of two electrode layers (18, 30) and an intermediate sandwich-like electroluminescent light-emitting layer (26) that is preferably formed from a polymer.

6. Measuring device as claimed in one of the claims 1 to 5, **characterized in that** the OLEDs (14) have a pixel size of less than 500 μm , preferably of less than 200 μm .
7. Measuring device as claimed in one of the claims 1 to 6, **characterized in that** the OLEDs (14) have a transparent front electrode layer (28) adjoining the support substrate (18) and a rear electrode layer (30) facing away from the substrate.
8. Measuring device as claimed in one of the claims 1 to 7, **characterized in that** the imaging optics (20) has at least one optical lens (36; 36', 36'') for forming an image of the light source (16) on a target area (34) of the test element (10) and/or of a target area (34) of the test element (10) on the photodetector (24).
9. Measuring device as claimed in one of the claims 1 to 8, **characterized in that** the imaging optics (20) has a plurality of microstructured, preferably aspherical lens units in a two-dimensional arrangement.
10. Measuring device as claimed in one of the claims 1 to 9, **characterized in that** the imaging optics (20) is formed by a lens structure moulded onto the support substrate (18) especially by embossing.
11. Measuring device as claimed in one of the claims 1 to 9, **characterized in that** the imaging optics (20) is formed by a foil material, preferably a polymer-based foil material having a lens structure (38) that is preformed especially by embossing, injection moulding or reaction moulding that is joined to the support substrate (18) in a planar fashion.

12. Measuring device as claimed in one of the claims 1 to 11, **characterized in that** the OLEDs (14) are arranged on one side and the imaging optics (20) are arranged on the opposite side of the support substrate (18).
13. Measuring device as claimed in one of the claims 1 to 12, **characterized in that** the support substrate (18) consists of a transparent flat material especially of a thin glass or an optionally multilayer polymer film.
14. Measuring device as claimed in one of the claims 1 to 13, **characterized in that** the photodetector (24) is formed by at least one layer-shaped organic photodiode (22).
15. Measuring device as claimed in claim 14, **characterized in that** a plurality of organic photodiodes (22) are arranged on the support substrate (18) as linear or planar sensor pixel array.
16. Measuring device as claimed in one of the claims 14 or 15, **characterized in that** the OLEDs (14) and optionally the photodiodes (22) are applied to the support substrate (18) by a coating process.
17. Measuring device as claimed in one of the claims 14 to 16, **characterized in that** a plurality of OLEDs (14) and photodiodes (22) that are locally combined as elementary photometers (58) and are arranged as a matrix on a surface of the support substrate (18), form a multiple photometer.
18. Measuring device as claimed in one of the claims 1 to 17, **characterized in that** the device (12) for positioning comprises a holder, a guide or a stop for the test element.

19. Measuring device as claimed in one of the claims 1 to 18, **characterized in that** the surface of the OLEDs (14) is screened from the environment in a material-tight manner by a coating or housing (50).
20. Measuring device as claimed in one of the claims 1 to 19, **characterized in that** that the test element (10) is formed by a test strip provided with optically scannable indicator fields (34) for biological substances to be detected and especially a test strip designed as a disposable article for example a glucose test strip.